REJOINDER

Claims 1, 4-7, 33, 34 and 36 and 37 are directed to an allowable product. Pursuant to the procedures set forth in MPEP § 821.04(B), claims 8-32, directed to the process of making or using an allowable product, previously withdrawn from consideration as a result of a restriction requirement, are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

Because all claims previously withdrawn from consideration under 37 CFR 1.142 have been rejoined, **the restriction requirement as set forth in the Office action mailed on 08/05/2005 is hereby withdrawn**. In view of the withdrawal of the restriction requirement as to the rejoined inventions, applicant(s) are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Bruce E. Kramer on 04/21/2008.

The application has been amended as follows:

The claims:

1. (currently amended): A polymetaphenylene isophthalamide-based polymer porous film with a gas permeability of 0.2-1000 ml/sec, which retains at least 60% of its gas permeability after heat treatment at 350°C for 10 minutes compared to before treatment, while also having a porous structure with a porosity of 60-80% and a cross-sectional pore laminar coefficient of 2.5 or greater, and having a specific Young's modulus of 200-800 $(kgf/mm^2)/(g/cm^3)$ in at least one direction, and containing inorganic whiskers having a long axis dimension L of 10 - 100 μm.

5. (currently amended): A polymetaphenylene isophthalamide-based polymer porous film containing inorganic whiskers having a long axis dimension L of 10 - 100 μm and having a porosity of 10-80% and a specific Young's modulus of 200-5000 $(kgf/mm^2)/(g/cm^3)$ in at least one direction and having a cross-sectional pore laminar coefficient of 2.5 or greater.

7. (currently amended): A polymetaphenylene isophthalamide-based polymer porous film containing inorganic whiskers with a long axis dimension L of ~~0.1-100 μm,~~ 10-100 μm, a short axis dimension D of 0.01-10 μm and an L/D ratio of 1.5 or greater, and having a porosity of 10-80% and a specific Young's modulus of 200-5000 $(kgf/mm^2)/(g/cm^3)$ in at least one direction, and having a cross-sectional pore laminar coefficient of 2.5 or greater.

8. (currently amended): A process for the production of a polymetaphenylene isophthalamide-based polymer porous film according to claim 1, comprising casting a dope

prepared by dissolving a polymetaphenylene isophthalamide-based polymer in an amide-based solvent, and coagulating it in a coagulating bath comprising an amide-based solvent containing a non-solvent for said polymer <u>to produce a polymetaphenylene isophthalamide-based polymer porous film according to claim 1</u>.

9. (~~withdrawn~~ original): A process according to claim 8, wherein the concentration of the amide-based solvent in the coagulating bath is 30-80 wt% and the temperature is 0-98°C.

10. (~~withdrawn~~ original): A process according to claim 8 or 9, wherein the non-solvent for the polymetaphenylene isophthalamide-based polymer is water.

11. (~~withdrawn~~ original): A process according to claim 8, wherein the dope prepared by dissolving a polymetaphenylene isophthalamide-based polymer in an amide-based solvent contains no inorganic salts.

12. (~~withdrawn~~ original): A process according to claim 8, wherein after coagulation, the porous film is rinsed with water, dried and then stretched to a factor of 1.3-5 in the uniaxial direction or to a factor of 1.3-10 in the orthogonal biaxial directions on an area scale, at a temperature of 270-340°C.

13. (~~withdrawn~~ original): A process according to claim 8 wherein, after coagulation, the porous film is further stretched in a stretching bath comprising an amide-based solvent containing a non-solvent for the polymetaphenylene isophthalamide-based polymer.

14. (~~withdrawn~~ original): A process according to claim 13, wherein the concentration of the amide-based solvent in the stretching bath is 5-70 wt% and the temperature is 0-98°C.

15. (~~withdrawn~~ original): A process according to claim 8, wherein the coagulation is followed by immersion in a bath comprising an amide-based solvent containing a non-solvent for

the polymetaphenylene isophthalamide-based polymer, with an amide-based solvent concentration of 50-80 wt% and a temperature of 50-98°C.

16. (~~withdrawn~~ original): A process according to claim 15, wherein the dimethylformamide-insoluble portion of the porous film after immersion is 10% or greater.

17. (~~withdrawn~~ original): A process according to claim 15 or 16, wherein after the immersion the porous film is rinsed with water, dried and then heat treated at a temperature of 290-380°C.

18. (~~withdrawn~~ original): A process according to claim 15 or 16, wherein after the immersion the porous film is rinsed with water, dried and then stretched to a factor of 1.3-5 in the uniaxial direction or to a factor of 1.3-10 in the orthogonal biaxial directions on an area scale, at a temperature of 270-380°C.

19. (~~withdrawn~~ original): A process according to claim 15 or 16, wherein after the immersion the porous film is further stretched in a stretching bath comprising an amide-based solvent containing a non-solvent for the polymetaphenylene isophthalamide-based polymer.

20. (~~withdrawn~~ original): A process according to claim 19 wherein, after the stretching, the porous film is rinsed with water, dried and then heat treated at a temperature of 290-380°C.

21. (~~withdrawn~~ original): A process according to claim 19, wherein the concentration of the amide-based solvent in the stretching bath is 5-70 wt% and the temperature is 0-98°C.

22. (~~withdrawn~~ original): A process according to claim 8, wherein the dope used is one in which inorganic whiskers are dispersed and a polymetaphenylene isophthalamide-based polymer is dissolved in an amide-based solvent.

23. (~~withdrawn~~ original): A process according to claim 22, wherein the weight ratio of the polymetaphenylene isophthalamide-based polymer to the whiskers is 50:50 to 99:1.

24. (currently amended): A process according to claim 22 or 23, wherein the inorganic whiskers have ~~a long axis dimension L of 0.1-100 μm,~~ a short axis dimension D of 0.01-10 μm and an L/D ratio of 1.5 or greater.

25. (currently amended): A porous film comprising at least two layers including a polymetaphenylene isophthalamide-based polymer porous layer and a heat-melting thermoplastic polymer porous layer, <u>wherein the polymetaphenylene isophthalamide-based polymer porous layer is a polymetaphenylene isophthalamide-based polymer porous film according to claim 1</u>.

26. (~~withdrawn~~ original): A porous film according to claim 25, wherein the thermoplastic polymer is a polyolefin with a molecular weight of 400,000 or greater.

27. (~~withdrawn~~ original): A porous film according to claim 25, wherein the thermoplastic polymer is a polyvinylidene fluoride-based polymer.

28. (~~withdrawn~~ original): A porous film according to claim 27, wherein the polyvinylidene fluoride-based polymer is a copolymer composed mainly of vinylidene fluoride and a perfluoro lower alkyl vinyl ether.

29. (~~withdrawn~~ original): A porous film according to any one of claims 25 to 28 wherein, at elevated temperatures, the thermoplastic polymer layer melts and plugs the pore gaps, while the polymetaphenylene isophthalamide-based polymer layer retains its shape without melting.

30. (currently amended): A process for the production of a porous film which comprises forming a porous layer of a polymetaphenylene isophthalamide-based polymer onto one or both

sides of a porous film made of a heat-melting thermoplastic polymer, or forming a porous layer made of a heat-melting thermoplastic polymer onto one or both sides of a porous film of a polymetaphenylene isophthalamide-based polymer, wherein the polymetaphenylene isophthalamide-based polymer porous layer is a polymetaphenylene isophthalamide-based polymer porous film according to claim 1.

31. (~~withdrawn~~ original): A battery separator comprising a porous film according to any one of claims 25 to 28.

32. (currently amended) : A lithium ion battery ~~employing~~ comprising a battery separator according to claim 31.

36. (currently amended): A polymetaphenylene isophthalamide-based polymer porous film with a gas permeability of 0.2-1000 ml/sec, which retains at least 60% of its gas permeability after heat treatment at 360°C for 10 minutes compared to before treatment, while also having a porous structure with a porosity of 60-80% and a cross-sectional pore laminar coefficient of 2.5 or greater and containing inorganic whiskers having a long axis dimension L of 10 - 100 μm, and which is obtained by a process comprising a step of casting a dope prepared by dissolving a polymetaphenylene isophthalamide-based polymer in an amide-based solvent and a step of coagulating the cast dope in a coagulating bath comprising an amide-based solvent containing a non-solvent for the polymer.

37. (currently amended): A method of using a polymetaphenylene isophthalamide-based polymer porous film, comprising disposing a polymetaphenylene isophthalamide-based polymer porous film as a separator ~~disposed~~ between an anode and a cathode of a battery, wherein the porous film has a gas permeability of 0.2-1000 ml/sec, retains at least 60% of its gas

permeability after heat treatment at 360°C for 10 minutes compared to before treatment, while also having a porous structure with a porosity of 60-80% and a cross-sectional pore laminar coefficient of 2.5 or greater <u>and containing inorganic whiskers having a long axis dimension L of 10 - 100 μm,</u> and having a specific Young's modulus of 200-5000 $(kgf/mm^2)/(g/cm^3)$ in at least one direction.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Note that Applicant's declaration, the examiner's amendment together are sufficient to overcome the art rejections and sufficient to place the instant claims in condition for allowance.

Of the references of record, the most pertinent are Daido et al (US 6,291,106) and Shinohara et al (US 6,447,958).

Daido discloses a porous reinforcing material comprising a non-woven fabric or a gas-permeable film having numerous open pores (column 7, lines 33-40). The declaration of Takahiro Daido makes clear that the gas permeable film of US'106 is referred to the film having a plurality of open pores, each extending through the thickness of the film as shown in figure 1. Nothing in Daido discloses or suggests the pore size of the gas permeable film. Therefore, Daido fails to teach the porous film having a cross-sectional pore laminar coefficient of 2.5 or greater as instantly claimed. Additionally, since the porous film of the present invention does not have the open pores, each extending through the film thickness in accordance with the process disclosed in the original disclosure, there is no basis of inherency to conclude that the

porous film of Daido would have the same cross-sectional pore laminar coefficient set forth in the claims.

Shinohara discloses a porous film comprising a heat resistant polymer and a ceramic powder wherein the ceramic powder is required to have a particle size of 1 micron or less in view of influence on strength of a battery separator and smoothness on coated surface (column 5, lines 1-15). One skilled in the art would not be motivated to add ceramic whiskers having a long axis dimension L of 10 -100 microns into the porous film because to do so would make the film fragile and handling thereof more difficult, thereby defeating the objectives of Shinohara.

The examiner disagrees with the “X” and “Y” citations listed in an international search report that is provided in EP 1 233 036 which is an equivalent form of the present application. None of these documents taken alone or in combination with other references teach or suggest the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hai Vo/
Hai Vo
Primary Examiner, Art Unit 1794